

International Conference in Bioenergy, Environment and Sustainable Technologies, BEST-2015

POWDER METALLURGY A POTENTIAL GREEN MANUFACTURING PROCESSES: A REVIEW

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Manufacturing design traditionally approached as techno-economic aspect, but the emerging awareness created by UN-world commission on environment and development (WCED) from the early 1990's, and the alarm of climatic and environmental issues has picked up to change the traditional design way to techno-economic-sustainable approach [1]. This in short can be stated as a green manufacturing technology; the major challenge lying in inculcating the sustainable aspect into traditional manufacturing design is cost despite seeing many advantages such as waste reduction, energy consumption reduction, recycling and so on. Unless, there is a technology that proves to have an economic viable as well as technically sustainable the developing countries would hardly take-up initiation to move from traditional approach, otherwise a legislative compulsion calls for. The powder metallurgy is one of such promising non-traditional manufacturing process that possesses high potential for green manufacturing [2]. The green manufacturing is not just about quality or environment or energy or recycling, but it's a combination of all for the betterment of companies, employees, stakeholders and customers. The present state of art powder metallurgy process caters the need of green technological requirement, which is being reviewed in this article comprehensively.

Key words: Powder metallurgy; sustainability; manufacturing processes

Introduction:

World commission on environment and development described about sustainability development as it is the development that meets the need of the present without compromising the ability of future generations to meet their own needs [3]. So a technology should be developed and/or adopted in manufacturing the product that should meet the aforementioned requirement. It is very imperative to save the environment to secure prospective for future generation. There is a quantitative relationship expressed in ref [4], in which the environmental impact found to directly proportional to world population and indirectly proportional to environmental efficiency of the technology. Further to note that the standard of living is also directly affecting the environment. The product produced through sustainable technology is termed as sustainable or green product. It has a raising awareness among the stake-holders to buy or go for green products. The legislation is being forced in the most developed as well as in developing countries to go for green product [5]. It is a force to adopt green technology by legislative means as well as to be in competition in the global market. In addition to the economical aspect, also, pushed the technology towards green as the cost cutting is mandatory in every aspect of design; that is during the design stage itself it should be depicted whether the process is net shape or near net shape to avoid excessive wastage, or reused or recycled and so on. The study has been proved that powder metallurgy (P/M) is a better alternative to traditional manufacturing due to its net shape processing ability, wastage revise feasibility and low energy consumption as compared to several other competitive processes [6].